

## WEATHER IN THE UNITED STATES

[Climatological Division, Oliver L. Fassig, in Charge]

## THE WEATHER ELEMENTS

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## GENERAL SUMMARY

For May as a whole temperature averaged from 2° to 6° below normal from western Ohio, middle Mississippi and lower Missouri valleys southward, while generally in the northern Great Plains and west of the Rocky Mountains the month was decidedly warmer than normal. Abnormally low temperatures prevailed about the 20th of the month with freezing weather as far south as Iowa and parts of Kansas. Thereafter warmer weather prevailed, with high temperatures the latter part of the month in the interior and Eastern States. The precipitation during the month was unevenly distributed, but considerable areas, especially in the East, had more than the normal amounts. Many portions of the Atlantic States from Florida to New England received from 25 to 50 per cent more than the average for the month, and other areas in the interior comprising northern Illinois and Missouri and portions of the Southwest had more than normal. Large deficiencies occurred in the Central Gulf States and the Northwest between the Lake region and the Rocky Mountains, as well as in the Pacific Northwest. But the smallest percentages of normal occurred in the eastern portions of Washington and Oregon and much of Arizona where less than 25 per cent of the normal was recorded.

## TEMPERATURE

West of the Continental Divide warm weather prevailed nearly all the month, and in the extreme Northwest the first half of the middle decade was especially notable for high temperatures.

From the Rocky Mountains eastward cool and warm periods alternated. A well-marked cool period affected nearly all of the middle and eastern sections about the 6th to 13th, but somewhat higher temperatures succeeded, especially in the upper Mississippi Valley, Lake region and Northeastern States.

A notable cool spell set in over the northern Plains about the 18th and advanced southward and eastward, reaching the Atlantic coast about the 22d; the duration of the cool weather was usually about four days, and the remainder of the month was marked by practically normal temperatures in most middle and eastern sections, save that high marks were reached from the 27th to the 31st in much of the Lake region and especially in the Middle and North Atlantic States.

In nearly all States east of the Rocky Mountains the month averaged cooler than normal, especially in the middle and southern Plains, the west Gulf region and the central valleys, where it averaged usually 3° to 5° cooler. In some Southeastern and South-Central States it was the third successive month to average considerably cooler than normal, and save February no month since September, 1930, has been warmer than normal in these sections. On the other hand, in Michigan, Wisconsin, Iowa, Minnesota, and South Dakota, May was the first month since October, 1930, to average cooler than normal.

Pennsylvania, New Jersey, New York, and New England averaged slightly warmer than normal, likewise North Dakota. In Montana and the Plateau and Pacific States the month was warmer than normal, usually to a marked extent. California averaged almost 6° hotter than normal, and in that State and Nevada every month so far this year has averaged at least 1° above. The

warmth since early March in southern California has been particularly notable. Los Angeles recorded no spring month previous to 1931 warmer than May, 1885, when the mean temperature was 65.6°. This year March and April each averaged 66°, 8.5° and 6.6° above normal, respectively, and May 67.5°, 5.3° above normal.

The highest temperatures during May in the States of the eastern half were usually from 93° to 98°, and occurred chiefly about the middle of the month or during the last five days. Marks above 100° were noted in nearly every State of the western half, the highest being 114° in California. These occurred usually about the 14th, on the 25th, or during the final two days.

In some Gulf States the lowest temperatures were as high as 40°, but mainly they were from 10° to 30°, save below 10° in some Rocky Mountain States. The dates of occurrence were scattered through the month, many Northeastern States noting them on the 1st, and other Eastern and Middle States, as a rule, either about the 8th or 12th, or else between the 20th and 24th.

## PRECIPITATION

The rainfall for the western half of the cotton region, which was poorly distributed and mainly much below normal, occurred chiefly during the opening week, or about the 20th; while in the eastern cotton region the distribution was better, yet most districts had by far the greater part of the month's supply during the first fortnight. The upper Ohio Valley had liberal rains about the middle of the month. In the Atlantic States from North Carolina northeastward the most important rains came near the close of the first decade or during the final decade.

The precipitation of the central valleys and the Lake region was comparatively well distributed in point of time, but much occurred about the 19th. The central Rocky Mountain region received its most important falls during the early days or else about the 28th.

The monthly totals were less than normal over considerably the larger part of the country. In the middle and upper Missouri Valley and thence westward to the north Pacific coast there was a marked deficiency, particularly in Idaho, Oregon, the eastern half of Washington and northern Montana, which usually received but one-quarter to two-fifths of the normal. The western half of the country otherwise had usually less than normal, save some parts of central and southern California, a strip extending from northeastern Colorado to the Texas Panhandle, and most of the lower Rio Grande Valley.

In the eastern half there was usually less than normal in the Gulf States, Arkansas, Tennessee, and the southern Appalachian region, in most of the lower Ohio and upper Mississippi Valleys and in much of the Lake region, especially near Lakes Erie and Huron. From northeastern Florida to central New England there was nearly everywhere an excess and a rather large excess occurred in the middle Appalachian region and the upper Ohio Valley. Much of Illinois and the lower Missouri Valley had a slight excess.

The largest amount reported from one station was 12.97 inches at Center Hall, Pa.

This month was the first since October, 1929, to bring more than normal precipitation at Washington, D. C. However, at Charleston, S. C. it was the eleventh consecutive month with less than normal.

In the Missouri Valley and to westward numerous districts have fallen far below their normal precipitation

for many months. At Helena, Mont., every month of the last six has failed to bring as much as half its normal precipitation; while at Sioux City, Iowa, Pocatello, Idaho, and Eureka, Calif., no single month yet this year has brought as much as 70 per cent.

## SNOWFALL

There was no important snowfall over the Plains or to eastward, except in a very few districts. About the 20th and 21st small amounts fell in eastern North Dakota and to eastward to the vicinity of Lake Superior, while three days later there was a moderate snowfall over much of south-central New York and northeastern Pennsylvania. A considerable portion of eastern Colorado and some parts of adjoining States had rather large amounts for the latter half of May about the 21st.

In the Pacific and Plateau States and practically all of Montana the month's snowfall was unimportant. On the other hand, some portions of the Rocky Mountains

had much new snow, two Colorado stations each measuring more than 50 inches during the month.

## SUNSHINE AND RELATIVE HUMIDITY

The Southwest generally, much of the Great Plains, the southern Rocky Mountains and most of the Plateau and portions of the lower Lake region received more than the normal amount of sunshine, while in the central and upper Mississippi Valley much cloudy weather prevailed. Elsewhere about the usual amount of sunshine for May was received. The relative humidity was below the normal generally from the upper Mississippi Valley westward to the Pacific and also throughout the central portions of the Rocky Mountain and Plateau regions, while in the Atlantic States, the Ohio and central Mississippi Valleys and the far Southwest it was generally above the normal, but the plus departures were in no case large.

## SEVERE LOCAL STORMS, MAY, 1931

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path, yards <sup>1</sup>	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Yakima, Wash.	1	2:30 p. m.				Whirlwind	Several small buildings wrecked	Official, U. S. Weather Bureau.
Rio Grande, Tex.	1	4:30 p. m.	4 mi.		\$2,500	Hail	Roofs damaged; glass broken	Do.
Bishop, Tex.	2	5 p. m.				Hail and wind	Crops and buildings damaged; path 35 miles long.	Do.
Grand Junction, Colo. (near)	3	5-6 p. m.	1-3 mi.			Hail	Considerable damage to pears	Do.
Stanton, Kearney, Finney, Haskell and Gray Counties, Kans.	4	3-5 p. m.	1-6 mi.		1,500,000	Hail and wind	Heavy loss of crops, chiefly wheat; buildings damaged; path 100 miles long.	Do.
Cimarron, Kans. (near)	4	4 p. m.	6		300	Small tornado	Several small buildings damaged; path 3 miles long.	Do.
Blair and Humphrey, Okla., and vicinity.	4	4-5 p. m.	5 mi.		6,700	Hail	Chief damage to crops; path 15 miles long.	Do.
Ness County, Kans.	4	4:45 p. m.	900		25,000	do	Damage chiefly to wheat; path 7 miles long	Do.
Davenport, Fla.	4	6 p. m.	2,640			do	Young citrus fruits considerably damaged	Do.
Electra, Tex.	4	6:30 p. m.				Wind, hail, and rain.	Roofs, chimneys, and merchandise damaged	Do.
Camden, Miss. (near)	4	A. m.			15,000	Tornado and hail	Buildings, fencing, and crops damaged; many large trees uprooted.	Do.
Jefferson and Page Counties, Iowa.	5	9:30-10:30 a. m.			10,000	Wind	Overhead wires and trees considerably damaged.	Do.
Camilla, Ga.	5				7,000	Wind, rain, and hail.	Several roofs damaged; trees blown down	Do.
Fredericksburg, Kerrville, and Comfort, Tex.	6	2:30 p. m.	4 mi.		25,000	Wind and hail	Cars and buildings damaged; considerable injury to crops.	Do.
Canning to Onida, S. Dak.	6	7-8 p. m.	8 mi.		25,000	Hail and wind	Several small buildings wrecked and other property damaged; 3 children injured.	Do.
Madison, Wis. (11 miles east)	6		50		75	Small tornado	Farm property damaged	Do.
Pittsburgh, Pa.	7					Severe thunderstorm.	Streets flooded; electric wires damaged	Do.
Rock Hill, S. C. (near)	7				1,000	Hail	Crops damaged	Do.
Dinwiddie and Prince Georges Counties, Va.	9	6-7 p. m.	¼-4 mi.			Hail and wind	Barns wrecked; fruits ruined in small area	Do.
Parkersburg, W. Va.	9				100,000	Severe thunderstorm.	A fire caused by lightning partially destroyed a mill.	Do.
Windsor, N. C., and vicinity	9					Hail	Tobacco beds and other crops damaged; roofs and windows pierced; poultry killed.	Do.
Bascom, Fla.	10	3 a. m.	1,760			do	Cotton and corn probably total loss	Do.
Albany, N. Y., and vicinity	10	5:15 p. m.	5 mi.		150,000	do	Poultry killed, auto tops and windows broken; roofs and small buildings damaged; fruit trees stripped; telephone company suffered loss.	Do.
Virginia (southeast counties)	10	4 p. m.	5 mi.		10,000	do	Character of damage not reported	Do.
Burlington County, N. J.	10	7:30 p. m.			300,000	do	Severe crop damage; fruit trees stripped; car tops dented.	Do.
Clinton, N. J., and vicinity	10	7:30 p. m.			25,000	do	Crops injured; some property damaged	Do.
Phelps and Junius, N. Y.	10		1,760			do	Fruit trees hurt; windows broken	Do.
Montrose, Pa.	10				5,000	Thunderstorm	Barn and contents destroyed	Do.
Thomas County, Ga. (northwestern)	10		1,760		1,500	Wind, rain, and hail.	Buildings and crops on one plantation damaged.	Do.
Cooperstown, N. Y.	11					Small tornado	A few roofs, trees, and garages damaged.	Do.
Greenbrier County, W. Va. (Falling Springs district).	11					Hail	Roofs and auto tops riddled; windows broken; fruit trees stripped; gardens ruined; poultry killed.	Do.
King William and Gloucester Counties, Va.	13	2-4 p. m.	5-10 mi.		6,000	do	Melon and truck crops seriously damaged.	Do.
Newman Grove, Nebr.	17	4-5 p. m.	3 mi.		3,000	Wind and hail	Farm buildings damaged; crops injured; path 10 miles long.	Do.
Dickinson County, Iowa	17	5 p. m.			8,000	Tornado and hail	Character of damage not reported	Do.
Osceola County, Iowa	17	5:30 p. m.			5,500	Tornado	Buildings damaged; livestock injured or killed; path 3 miles long.	Do.
Marietta, S. C.	17				1,000	Hail	Crops damaged	Do.
Tennessee (eastern)	17-18					do	Fruit and other young crops damaged	Do.
Russell County, Va.	18	2 p. m.	2 mi.			do	Considerable damage, character not reported	Do.
Belmont and adjacent counties, Ohio.	18-19				100,000	do	Crops, buildings, and other property severely damaged.	Do.
Sallis, Miss. (4 miles west)	19	A. m.				Violent wind	A barn and residence demolished; 1 person injured; storm covered about an acre.	Do.

<sup>1</sup> "Mi" signifies miles instead of yards.